IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Allen D. Parks et al.   Atty. Docket No.: NC 82343

Application No.: Filed Concurrently   Group Art Unit: Not Yet Assigned

Filed: August 30, 2001   Examiner: Not Yet Assigned

For: **METHOD AND APPARATUS FOR CLOCK SYNCHRONIZATION USING QUANTUM MECHANICAL NON-LOCALITY EFFECTS**

PRELIMINARY AMENDMENT UNDER 37 C.F.R. §1.111

Honorable Assistant Commissioner
        for Patents
Washington, D.C. 20231

Sir:

Prior to examination of the of the above-identified application on the merits, please amend the above-identified application as follows:

IN THE CLAIMS:

Please CANCEL Claim 14 without prejudice to or disclaimer of the subject matter thereof and ADD new Claims 15-17 as follows:

--15. In a clock synchronization system permitting synchronization of a slave clock to a master clock located in slave and master devices, respectively, communicating with one another via two separate communication channels, a combination comprising:

means for generating a laser beam signal disposed in the master device, wherein the signal beam has first and second operating modes;

means for applying the signal beam to the slave device over a master communication channel;

a master homodyne detector disposed in the master device receiving a master phase shifted local oscillator beam;

a slave homodyne detector disposed in the slave device receiving a second phase shifted local oscillator beam;

means for recording master and slave correlation patterns generated by the master and slave homodyne detectors while the signal beam cycles between first and second operating modes;

means for transmitting the master correlation pattern and associated first and second times at which the signal beam shifted between the first and second operating modes and between the second and first operating modes over the second communications channel;

processing means for processing a portion of the master correlation pattern between the first and second times with respect to the slave correlation pattern to thereby determine the transit time (Δt) between the master and slave clocks.--

--16. The combination as recited in claim 15, wherein:

the master and the slave clocks are synchronized; and

the processing means determines the distance d between the master and slave devices using the formula $d = c \times \Delta t$,

where c is the speed of light.--

--17. The combination as recited in claim 16, wherein the processing means:

first determines the distance d at times t_1 and t_2 to thereby generate distances d_1 and d_2; and

then determines the line of sight velocity (v)of the slave device with respect to the master device is determined using the formula $v = \dfrac{d_2 - d_1}{t_2 - t_1}$.--

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REMARKS

As a result of the instant Amendment, Claims1-13 and 15-17 are pending in the Application. In the Preliminary Amendment, claim 14 is cancelled in favor of claims 15-17.

Copies of the claims without annotations are provided in the Appendix attached hereto.

It is respectfully submitted that the instant Amendment does not introduce new matter into the application. It is also respectfully submitted that the Preliminary Amendment places the above-identified application in even better condition for initial examination.

In light of the amendments and remarks presented above, it is respectfully submitted that the application is in condition for allowance, and such action is hereby solicited.

If any points remain in issue which the Examiner feels may best be resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

Respectfully submitted,

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APPENDIX

15. In a clock synchronization system permitting synchronization of a slave clock to a master clock located in slave and master devices, respectively, communicating with one another via two separate communication channels, a combination comprising:

means for generating a laser beam signal disposed in the master device, wherein the signal beam has first and second operating modes;

means for applying the signal beam to the slave device over a master communication channel;

a master homodyne detector disposed in the master device receiving a master phase shifted local oscillator beam;

a slave homodyne detector disposed in the slave device receiving a second phase shifted local oscillator beam;

means for recording master and slave correlation patterns generated by the master and slave homodyne detectors while the signal beam cycles between first and second operating modes;

means for transmitting the master correlation pattern and associated first and second times at which the signal beam shifted between the first and second operating modes and between the second and first operating modes over the second communications channel;

processing means for processing a portion of the master correlation pattern between the first and second times with respect to the slave correlation pattern to thereby determine the transit time (Δt) between the master and slave clocks.

16. The combination as recited in claim 15, wherein:

the master and the slave clocks are synchronized; and

the processing means determines the distance d between the master and slave devices using the formula $d = c \times \Delta t$,

where c is the speed of light.

17. The combination as recited in claim 16, wherein the processing means:

first determines the distance d at times t_1 and t_2 to thereby generate distances d_1

and d_2; and

then determines the line of sight velocity (v) of the slave device with respect to the

master device is determined using the formula $v = \dfrac{d_2 - d_1}{t_2 - t_1}$.